

# **Research Article**

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# Functional, Communicative, and Critical Health Literacy among Iranian Patients with Heart Failure: a Cross- sectional study

#### Mahin Nomali<sup>1</sup>, Kian Alipasandi<sup>2</sup>, Ramin Mohammadrezaei<sup>3</sup>

- **1** Ph.D Student of Epidemiology (MSN), Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran
  - 2 Resident of Cardiology (MD), Department of Cardiology, Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran
  - **3** Fellowship of Heart Transplantation and Advanced Heart Failure, Heart Failure Clinic, Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran

## Abstract

Background: Heart failure (HF) is a major public health with rising prevalence, worldwide. Low health literacy (HL) among patients with HF is associated with clinical outcomes. On the other hand, considering low HL is necessary when designing interventions to improve self-care. Aims and objectives: the aim was to determine functional, communicative and critical HL among Iranian patients with HF. Study Design: This was a cross sectional study. Setting: This study was carried out at the HF clinic of Tehran Heart Center (THC) affiliated with Tehran University of Medical Sciences (TUMS, Tehran, Iran). Materials and Methods: 210 adult patients with confirmed diagnosis of HF for at least 3 months and with NYHA function class II to IV and an ability of reading and writing Farsi language were included in the study during June 2017 and March 2018 with consecutive sampling. Data were collected in a short form that was included demographic and clinical variables which was completed according to patients' self-report and their clinical records. HL was measured by Heart Failure-Specific HL Scale (Cronbach's alpha=0.71). Scores were reported totally and in 3 domains of functional, communicative, and critical HL. Scores less than the median was considered as low HL. Statistics: Data were described by descriptive statistics such as frequency and partial frequency distribution for categorical variables and mean, median, standard deviation (SD), and interguartile range (IQR) for continuous variables. Results: 188/210 patients with HF participated in the study. The mean age of patients was 59.5 (14.5) years old. The majority of patients were male (64.9%), married (83.5%), and were at the high school level of education (38.4%). In addition, 66.1% of them were employed. The low level of total, functional, communicative, and critical HL was seen among 17%, 54.8%, 60.1%, and 58% of patients with HF. Conclusion: patients with HF had a high level of total HL. While the level of functional, communicative, and critical HL was lower among patients with HF. Thus, there is need to be improved by appropriate intervention.

Keywords: Health literacy, Heart Failure-Specific Health Literacy Scale, Heart failure, Cross-sectional study, Iran.

## INTRODUCTION

Heart failure (HF) is a common disease. It is a major public health problem worldwide. In developing countries, changing to western lifestyle may be a contributing factor to an HF pandemic <sup>[1]</sup>.

HF prevalence is rising because of the ageing population and treatment improvements <sup>[1]</sup>. Patients with HF experience different outcomes. Some of comorbidities, an all-cause hospitalization or emergency department visit through the previous year may be associated with worse outcomes <sup>[2]</sup>. Previous studies indicated that Low health literacy (HL) is associated with increased risk of hospitalization <sup>[3]</sup> and death in patients with HF <sup>[3,4]</sup>. In addition, it has been shown that critical HL was associated with self-care behavior in patients with HF <sup>[5]</sup>.

HL is defined as the patients' ability to obtain and evaluate information critically in order to use such information on making appropriate decisions related to healthcare and lifestyle <sup>[6]</sup>. As a comprehensive definition, HL is comprised 3 following levels: (1) functional literacy, which is basic reading and writing skill that permit someone to function effectively in everyday conditions; (2) communicative literacy, which is the advanced skills that let a person extract information from different sources and apply them to change situations; and (3) critical literacy, which is the more advanced skills to analyze information critically and use information to have greater control over life events and situations <sup>[7]</sup>.

#### \*Corresponding author: Mahin Nomali

Ph.D Student of Epidemiology (MSN), Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran Email: According to a group from Mayo Clinic, several steps should be taken regarding HL among patients with HF. First, we all need to be familiar with the concept of HL and its effect on HF clinical outcomes. Second, HL should be assessed by health care providers via simple tools. Finally, health care providers should improve their communication with patients with HF based on the patient's level of HL <sup>[8]</sup>. The HL level of both patient and family should be considered when designing interventions to improve self-care <sup>[9]</sup>. On the other hand, considering the prevalence of low HL among patients with HF is helpful to recognize the consequences of low HL and to adopt strategies in order to minimize its detrimental effect on patient's health outcomes <sup>[10]</sup>. Thus, the aim was to determine communicative, functional, critical HL among Iranian patients with HF.

#### MATERIAL AND METHODS

We carried out a cross- sectional study at the HF clinic of Tehran Heart Center (THC) affiliated with Tehran University of Medical Sciences (TUMS, Tehran, Iran). During the study period from June 2017 to March 2018, 188 patients were included in the study via consecutive sampling. Before beginning of the study, we obtained oral informed consent from eligible patients.

The sample size was calculated by the following formula and according to the appropriate HL proportion of 69.3% in the Razazi *et al* study <sup>[11]</sup>. Therefore, at significance level of 5 %,  $Z1-\alpha/2$  of 1.96, d of 0.07 (i.e. 10 % of the appropriate HL proportion) <sup>[11]</sup>, the sample size was estimated 174 and by considering non- response rate of 20%, the final sample size was 210.

$$n = \frac{\left(z_{1-\alpha/2}\right)^2 pq}{d^2}$$

In this study, adult patients (age older than 18 years old) with a definite diagnosis of HF for at least 3 months and NYHA function class II to IV and with an ability of reading and writing Farsi language were included in the study. The patients avoided to participate in the study and incomplete questionnaires were excluded from study analysis.

Data were collected in a short form that was included demographic variables (e.g., age, sex, marital status, level of education, and employment status) and clinical variables (e.g. HF duration, systolic and diastolic blood pressure, heart rate, ejection fraction, NYHA function class, disease etiology, comorbidities, previous hospitalization, implantable cardiac devices, and medications). This short form was completed according to patients' self-report and their clinical records.

Health literacy was measured by Heart Failure-Specific Health Literacy Scale (Cronbach's alpha=0.71). This scale had 12 items with 4 following options; inapplicable, rarely, sometimes, and strongly applicable with a score from 1 to 4, respectively. In this scale, items with higher score considered as higher levels of HL except item number 1 to 4 [12]. The Iranian version of this scale was used in Nomali et al. study at first <sup>[13]</sup>. The face and qualitative content validity were approved by an expert panel (nursing faculty members, nurse practitioners, and cardiologists affiliated with TUMS) and patients with HF. It was a reliable scale and the Cronbach's alpha was 0.766 and deletions of any items could not improve the Cronbach value as same as the original scale <sup>[14]</sup>. In this study, we reported scores totally and in 3 domains of functional (i.e. questions 1-4), communicative (i.e. questions 5-8), and critical (i.e. questions 9-12) HL. In order to identify patients with lower HL in each HL domain, we calculated median and scores less than the median was considered as lower HL.

#### Statistical analysis:

We entered data in the SPSS software version 16. Categorical variables were described by frequency and partial frequency distribution. Normality of continuous variables was checked by the Kolmogorov-Smirnoff test. Continuous variables were described by mean, median, standard deviation, and IQR.

## RESULTS

During the study period, 188 patients with mean age of 59.5 (14.5) years old completed the study (participation rate of 89.5%). The majority of study patients were male (64.9%), married (83.5%), and were at the high school level of education (38.4%). In addition, 66.1% of them were employed. Clinical characteristics of study patients have been presented in table 1. According to this table, the majority of patients were with NYHA function class II (53.2%), and with an etiology of ischemic heart disease (62.2%). In addition, most of them had previous hospitalization (74.5%).

The median and IQR of total, functional, communicative, and critical HL were 32 (27-38), 12 (7.25-16), 13 (10-15), and 9 (5-12), respectively. The frequency distribution of total, functional, communicative, and critical HL has been indicated in Fig. 1. Although patients with HF had a high level of total HL in this study, their functional, communicative, and critical HL was low (Fig.1).



Figure 1: Frequency distribution of total, and three domains of health literacy among patients with heart failure

| Variables                                    |   | Frequency (%) |
|--|---|---------------|
| HF duration (month) [Median(IQR*)]           |   | 14.5 (30.0)   |
| Systolic Blood Pressure (mmHg)[Median(IQR)]  |   | 115.0 (27.0)  |
| Diastolic Blood Pressure (mmHg)[Median(IQR)] |   | 73.0 (17.0)   |
| Heart Rate (bpm) [Median(IQR)]               |   | 78.0 (16.7)   |
| Ejection Fraction (%) [Median(IQR)]          |   | 25 (10)       |
| NYHA function class                          | 11  | 100 (53.2)    |
|  | 111                                       | 77 (40.9)     |
|  | IV  | 11 (5.9)      |
| Etiology (yes/no)                            | Ischemic heart disease                    | 117 (62.2)    |
|  | Cardiomyopathy                            | 28 (14.8)     |
|  | Hypertensive disease                      | 32 (17.1)     |
|  | Valve disease                             | 8 (4.3)       |
|  | Others                                    | 3 (1.6)       |
| Comorbidities (yes/no)                       | Hypertension                              | 86 (45.7)     |
|  | Diabetes                                  | 62 (33.0)     |
|  | Dyslipidemia                              | 28 (14.9)     |
|  | Chronic Kidney Disease                    | 21 (11.2)     |
|  | Chronic Obstructive Pulmonary Disease     | 7 (3.7)       |
|  | Atrial Fibrillation                       | 31 (16.5)     |
| Past medical history (yes/no)                | Percutaneous Coronary Intervention        | 51 (27.1)     |
|  | Coronary Artery Bypass Graft surgery      | 1 (0.5)       |
|  | Valve surgery                             | 4 (2.1)       |
|  | Transplantation                           | 1 (0.5)       |
| Previous hospitalization (yes/no)            |   | 140 (74.5)    |
| Implantable Cardiac Devices (yes/ no)        |   | 21 (11.17)    |
| Medication (yes/ no)                         | Angiotensin- converting enzyme inhibitors | 104 (55.3)    |
|  | Angiotensin receptor blockers             | 50 (26.60     |
|  | Beta blockers                             | 162 (86.2)    |
|  | Diuretics                                 | 159 (84.6)    |
|  | Aspirin                                   | 107 (56.9)    |
|  | Statins                                   | 30 (15.9)     |
|  | Vitamin K antagonists                     | 63 (33.5)     |
|  | Digitals                                  | 40 (21.3)     |

\*Interquartile range

#### DISCUSSION

This study indicated the majority of patients with HF had a high level of total HL and only 17% of them had low HL. Inconsistent with our results, a systematic review on HL and HF indicated that an average of 39% of patients with HF had low HL <sup>[10]</sup>. Although the result of this systematic review was similar to ours, the tools used to evaluate HL among included studies in this review were different. Opposite of appropriate level of HL among patients with HF in our study, HL of the Iranian population was reported inadequate and borderline according to a systematic review in 2018 <sup>[15]</sup>. Therefore, these differences may be due to some factors such as age, race/ethnicity, years of education, and cognitive function that affect HL among patients with HF <sup>[10]</sup>. Thus, further researches are needed to evaluate HL by HF- specific HL scale.

In this study, one of the domains of HL was functional HL. Functional HL is related to reading and writing skills that allows someone to function effectively <sup>[16]</sup>. According to our study, the prevalence of low functional

HL was high among the study patients. While in Razazi et al study in 2018, 69.3% of patients with HF had appropriate HL [11]. This difference may be due to the study tools evaluating HL. Another domain of HL was communicative HL. It is an advanced skill in which a person can extract information from different sources and apply new information to change his/her condition <sup>[16]</sup>. In our study, patients with HF had low communicative HL. The last domain of HL was critical HL. Critical literacy is a much more advanced skill than communicative literacy in which a person can analyze critically the collected information and use them in order to greater control over health related events <sup>[16]</sup>. Critical HL of patients with HF was low in our study, too. Communicative and critical HL were independently associated with the patient's understanding of care and self-efficacy <sup>[17]</sup>. In addition, Matsuoka et al (2015) reported that critical HL was independently associated with self-care behavior in patients with HF [6]. Thus, these domains of HL need to be improved among patients with HF.

#### CONCLUSION

In conclusion, patients with HF had a high level of total HL. While the level of functional, communicative, and critical HL was lower among patients with HF. According to our knowledge, it was the first study that evaluated the 3- level of HL among patients with HF. Thus, it is recommended to be replicated in different HF settings in order to provide appropriate educational interventions to improve patient care.

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## **Conflict of interest:**

The authors declare that there is no conflict of interest.

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